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Patterns of General Surgery Residency Social Media Use in the Age of COVID-19



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OBJECTIVE: The role for social media use by General Surgery departments continues to expand and social media accounts have been increasingly implemented as a tool for residency program for promotion and engagement. The importance of these accounts appears to have increased given the unprecedented changes with COVID-19 and the dramatic and unpredictable change to the application cycle including the use of virtual interviews, suggesting a perceived need for increased online engagement with applicants. The purpose of this study was to determine the patterns of creation and usage of Twitter and Instagram accounts of Accreditation Council for Graduate Medical Education (ACGME)-accredited General Surgery residency programs and their associated surgical departments.

METHODS: A cross-sectional study of the use of Twitter and Instagram by the 332 ACGME-accredited General Surgery residency programs and their associated departments was conducted in February 2021. Twitter and Instagram accounts were identified by accessing program/department websites as well as social media platform and internet searches. Year of creation, number of followers, and number of posts (July 1, 2018–December 31, 2020) were collected. Trends in usage were compared across years stratified by platform and by account owner (department vs. residency).

RESULTS: Instagram accounts are more than five-times greater for residencies compared to departments (42% vs 8%, $p < 0.001$). There was not a significant difference between the number of department and residency

Twitter accounts (26% vs 23%, $p = 0.37$). Significantly more residency Instagram and Twitter accounts were created or first posted in 2020 compared to department accounts (Instagram: 100 vs 7, $p < 0.001$; Twitter: 31 vs 6, $p = 0.001$). Over 18% of residency programs had both Twitter and Instagram accounts compared to only 6% of departments ($p < 0.001$). However, department Twitter and Instagram accounts had significantly higher median total posts from 7/1/2018–12/31/2020 (Twitter: $p = 0.0001$, Instagram $p = 0.004$). While the number of Instagram followers and accounts being followed were similar between residencies and departments, department Twitter accounts had a larger median number of followers (1141 vs. 430, $p = 0.003$) and account followings (308 vs. 192, $p = 0.001$) compared to residency accounts.

CONCLUSIONS: The number of residency social media accounts has significantly increased in 2020 compared to account creation of departments, with Instagram account creation exceeding that of Twitter and of departments. The opposite pattern in usage was seen related to number of posts, and with Twitter, followers, and number of followings, with departments outpacing residencies. This significant increase in account creation may have been influenced by the COVID-19 pandemic and the change to a virtual interview season, suggesting an unprecedented need for online engagement with applicants. As the increased social media presence will likely persist in future application cycles, further study about the impact of residency social media use on recruitment and applicant decision-making as well as effective strategies, is needed. (J Surg Ed 78:e218–e225. © 2021 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

ABBREVIATIONS: ACGME, Accreditation Council for Graduate Medical Education GME Graduate Medical Education

KEY WORDS: Social media, Twitter, Instagram, General surgery residency, Residency match

Author Contributions: All authors made substantial contributions to the conception or design of the work or the acquisition, analysis, interpretation of the data for the work, and final approval of the manuscript. Drafting of the work or revising it critically for important intellectual content (BB, JD, JL). All authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Funding sources: None

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COMPETENCIES: Professionalism, Interpersonal and Communication Skills, Practice-Based Learning and Improvement

INTRODUCTION

Over the last several years, academic medicine has paralleled the global adoption of social media. Specifically, social media is used by the medical community for public health outreach, dissemination of research findings, recruitment for research studies, professional networking, and education technologies.¹⁻³ More recently, the role of social media has expanded and been implemented as a promotional tool for graduate medical education (GME) programs and departments alike.

In light of the global COVID-19 pandemic, the use of social media has become even more widespread, with new advantages and capabilities identified.⁴ In early 2020, it became apparent that the 2020-2021 residency application cycle would transition to a virtual-based experience. The abrupt cessation of the typical away-rotations, in-person interviews, and hospital tours left a stark void in the applicant-program connection.

From the applicant perspective, matching to a general surgery program comes with a substantial commitment of five to seven years. Applicant impressions from in-person visits to a surgical program have been shown to be crucial in consideration of program ranking.⁵ In the face of the pandemic, many programs pivoted and adopted new ways to interact with applicants, through virtual platform meet-and-greets, virtual rotations, and engagement via social media platforms including but not limited to Twitter and Instagram. Programs attempted to capitalize on unique opportunities to showcase current residents and faculty, operative opportunities, research capabilities, and other attributes, hoping to better inform and recruit applicants to programs. One recent commentary noted that the adaptation of social media by general surgery programs during this virtual application season added a humanizing component and gave prospective applicants a much-needed glimpse of program culture that would otherwise have been lost.⁶

Several studies have looked at trends of social media use by various surgical specialties, including otolaryngology, plastic and reconstructive surgery, urology, vascular, and recently general surgery.⁷⁻¹² However, there is little information about current patterns of social media use during the COVID-19 pandemic by general surgery residency programs and departments. The

purpose of this study was to explore the patterns of use of Twitter and Instagram, in 2020 versus prior years, by general surgery residency programs and their respective departments.

METHODS

Study Design

This cross-sectional study of the use of social media by Accreditation Council for Graduate Medical Education (ACGME)-accredited general surgery residency programs and departments associated with these programs was conducted in February 2021. Departments not associated with an ACGME-accredited residency were excluded. This study received approval from the Institutional Review Board. A list of ACGME accredited general surgery residency programs was obtained from the ACGME website.

Datapoint Collection

Year of account (Twitter [year of creation] or Instagram [year of first post]) creation, type of account (department vs residency), total number of followers, and total number of accounts following were recorded on February 1, 2021; posts per academic year on both platforms were tabulated from July 1, 2018-December 31, 2020. An account was noted to be residency-specific (herein termed residency) if the account name or headline included “residency,” “residency program,” or “resident run.” An account was noted to be a department-specific account (herein termed department) if the account name or headline included “department of surgery” or “department.” If an account included both “department” and “residency” in the headline or account name, then the account was counted as both a residency account and a department account.

Twitter accounts were identified by accessing program/department websites as well as internet and Twitter searches. Total number of tweets, including tweets, retweets, and responses were tallied by month using www.tweetstat.com. Using the same list of ACGME accredited general surgery residency programs, residency and department Instagram accounts were identified by searching the Instagram application. Accounts followed by the Instagram handle @surgeryprograms were also reviewed and compared to program accounts found by direct searching. One residency program had two active Instagram accounts that were considered residency accounts, both created in 2020; their usage data was averaged and listed as one residency account, which was then included in the usage analysis and year of account creation analysis. One department Instagram

account has not posted content, and thus does not have a year of first post. Similarly, five residency Instagram accounts had not yet posted or were private; therefore, these do not have a year of first post. The total number of followers, accounts being followed, and total posts for each account were recorded. The number of posts per academic year were manually counted using a similar timeframe as Twitter.

Statistical Analysis

Descriptive statistics were used to determine the prevalence of department and residency social media use on the two platforms. Categorical variables are reported as number and percentage, and continuous variables are reported as median (interquartile range [IQR]). Bivariate analysis comparing the number of followers, number following, and total tweets based on account type was performed with Wilcoxon rank sum. Associations between account type and account characteristics were assessed with chi-square. An alpha level of 0.05 was used for statistical tests. Statistical analysis was performed using STATA 16.1 (StataCorp, College Station, TX).

RESULTS

Account Demographics

One hundred and sixty-two Twitter accounts (24.4% of 662 residencies and their associated departments) were identified and analyzed (Table 1). Of these accounts, 86

were identified as residency Twitter accounts, representing 25.9% of all general surgery residency programs. There were 76 department accounts, representing 22.9% of all residency-associated departments ($p = 0.37$; Table 2). There were 21 programs (6.3%) with both residency and department Twitter accounts: 20 of these programs were academic, and one program was community-university affiliated.

One hundred and sixty-five Instagram accounts were identified and analyzed (Table 1). There was a more than five-fold greater prevalence of residency accounts; 41.6% ($n = 138$) of residencies and 8.1% ($n = 27$) of departments, had Instagram accounts ($p < 0.001$, Table 2). Four programs had both residency and department Instagram accounts; three of these programs were considered academic, and one program was considered a community program.

When analyzing all accounts by program type, academic departments/residencies had the greatest percentage of programs with Twitter (44.1%), or Instagram (37.1%) accounts compared to other program types (Table 1). Twitter trends in account presence in residencies and departments were similar regardless of program type with the exception of community programs, in which residency account presence was greater than in associated departments (18.4% vs 2.4%, $p < 0.001$, Table 2). Instagram account presence was significantly greater in all residency program types, with the exception of military programs ($p < 0.001$ for academic, community, community-affiliated programs; 0.087 for military programs; Table 2). Sixty-one (18.3%) of general surgery residency programs had both residency Twitter and Instagram accounts compared to only 6.3% ($n = 21$) of general surgery departments that had both accounts.

In the first six months of 2020, the number of new residency Twitter accounts more than tripled compared to new accounts created in 2019 (31 vs 10; $p = 0.012$; Fig. 1a and 2). Mirroring Twitter trends over the past half decade, the annual number of new residency Instagram accounts has continued to increase, with significantly more residency Instagram accounts created or first posted in 2020 compared to the prior half decade combined (100 vs 33, $p < 0.001$; Fig. 1b and 2). In the first six months of 2020, residency Instagram account creation demonstrated a nearly seven-fold increase compared to new accounts created in 2019 (100 vs. 15, $p < 0.001$; Fig. 2). This is the second year in a row that saw new resident Instagram account creation outpace new resident Twitter account creation (Fig. 2), with an overall 1.6-fold greater number of residency Instagram accounts, compared to Twitter.

TABLE 1. Descriptive statistics of Twitter and Instagram accounts based on total number of departments and residency programs.

	Twitter Total (n = 664)	Instagram Total (n = 664)
<i>Account Demographics (n, %)</i>		
Presence of Account	162 (24.4)	165 (24.9)
<i>Program Type (n, % of program type)</i>		
Academic (n = 272)	120 (44.1)	101 (37.1)
Community (n = 250)	26 (10.4)	44 (17.6)
Community-University Affiliated (n = 122)	15 (12.3)	16 (13.1)
Military (n = 20)	1 (5.0)	4 (20.0)
<i>Account Usage (median, IQR)</i>		
Number Following	249 (102-539)	161 (75-276)
Number of Followers	602 (305-1398)	666 (335-972)
Total Number of Posts*	188 (61-440)	38 (20-65)

*07/01/18-12/31/20.

IQR: Interquartile range.

TABLE 2. Descriptive statistics of residency and department Twitter and Instagram accounts

	Twitter		p -value	Instagram		p -value
	Residency Program (n = 332)	Department (n = 332)		Residency Program (n = 332)	Department (n = 332)	
Account Demographics (n, %)						
Presence of Account	86 (25.9)	76 (22.9)	0.366	138 (41.6)	27 (8.1)	< 0.001
Program Type (n, % of program type)						
Academic (n = 136)	54 (39.7)	66 (48.5)	0.143	78 (57.4)	23 (16.9)	< 0.001
Community (n = 125)	23 (18.4)	3 (2.4)	< 0.001	41 (32.8)	3 (2.4)	< 0.001
Community-University Affiliated (n = 61)	9 (14.8)	6 (9.8)	0.408	15 (24.6)	1 (1.6)	< 0.001
Military (n = 10)	0 (0)	1 (10.0)	1.000	4 (40.0)	0 (0)	0.087
Account Usage (median, IQR)						
Number Following	192 (75-376)	308 (120-945)	0.003	162 (85-269)	103 (36-343)	0.452
Number of Followers	430 (172-829)	1141 (442-2372)	< 0.001	647 (329-949)	849 (345-1121)	0.073
Total Number of Posts*	124 (25-257)	331 (123-1067)	< 0.001	34 (19-57)	63 (44-103)	0.004

Categorical variables listed as n (%), continuous variables listed as median (IQR).

*07/01/18-12/31/20.

IQR: Interquartile range.

Account Usage

The median number of department Twitter followers was significantly greater than those of residencies (1141 [442-2372] vs 430 [172-829], $p < 0.001$; Table 2). Department accounts had a higher median number of total Tweets from 7/1/2018-12/31/2020 (median: 331 [123-1067] vs 124 [25-257], $p < 0.001$) and were following more accounts (median: 308 [120-945] vs 192 [75-376], $p = 0.003$; Table 2) than residency accounts. Department Twitter accounts also generated a significantly higher median number of Tweets per program per academic year compared to residency accounts (2018-2019: $p < 0.001$, 2019-2020: $p < 0.001$, 2020-2021: $p = 0.001$; Fig 3a).

Median number of total Instagram followers (849 [345-1121] vs 647 [329-949], $p = 0.07$) and total number of accounts following (103 [36-343] vs 162 [85-269], $p = 0.45$) for departments and residencies were similar. Department Instagram accounts had a significantly higher median number of total posts from 7/1/2018-12/31/2020 (63 [44-103] vs. 34 [19-57], $p = 0.004$). The difference in median number of posts between Instagram department and resident accounts was not significant in any academic year (Fig. 3b). Department Instagram accounts had a higher median number of posts per program per academic year in 2018-2019, though the trend is shifting, with residency accounts gradually, though not significantly, exceeding department use since the 2019-2020 academic year (Fig. 3b). Residency Instagram usages in the first six

months of 2020-2021 academic year slightly exceeded total annual academic usage in prior years.

DISCUSSION

Social media use by general surgery residency programs has changed drastically in the last several years, especially during the COVID-19 pandemic.^{13,14} With the radical changes to the application cycle in 2020, many general surgery programs relied on social media platforms to recruit applicants and highlight their programs.^{6,13,15} We analyzed Twitter and Instagram usage patterns by general surgery residency programs compared to use by their associated departments. Overall, 23% of general surgery departments had a Twitter account, similar to previously reported rates of Twitter account use by surgery departments; 26% of general surgery residency programs had a Twitter account.¹⁰ New residency Twitter and Instagram accounts continue to outpace creation of department Twitter and Instagram accounts. In fact, residency Instagram accounts now are nearly five-fold greater than those associated with a surgical department and residency Twitter accounts are 1.1-fold greater than those associated with a surgical department, potentially suggesting the perceived importance of their use for resident recruitment.¹⁵

While the number of social media accounts is greater for residency programs, usage data suggests an opposite trend, particularly with Twitter usage; department

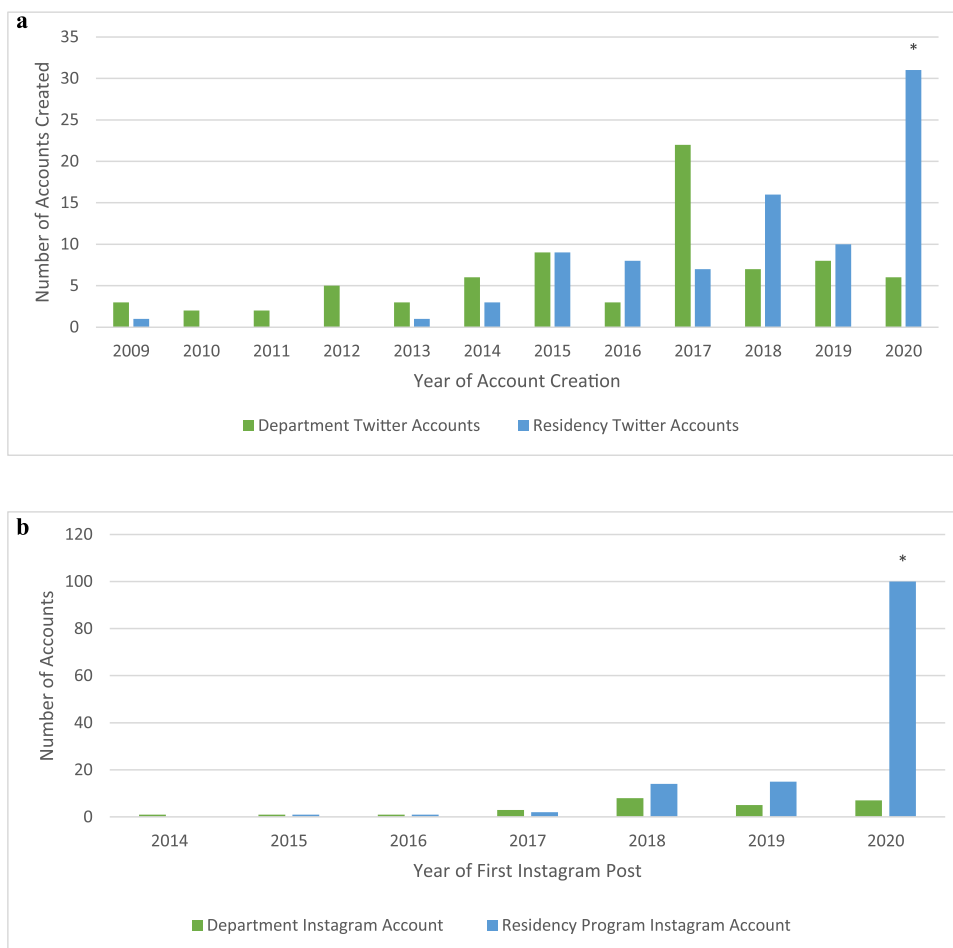


FIGURE 1. Number of accounts created by surgical department or residency program stratified year of initial creation (**1a.** Twitter, * $p = 0.001$ with new residency accounts exceeding department accounts in 2020) or first post (**1b.** Instagram, * $p = 0.001$ with new residency accounts exceeding department accounts in 2020).

Twitter accounts have significantly larger numbers of account followers and posts, which may be due to their increased longevity compared to relatively newer

residency Twitter accounts. A previously published study focusing on general surgery departmental use of Twitter found that 66% of department accounts were

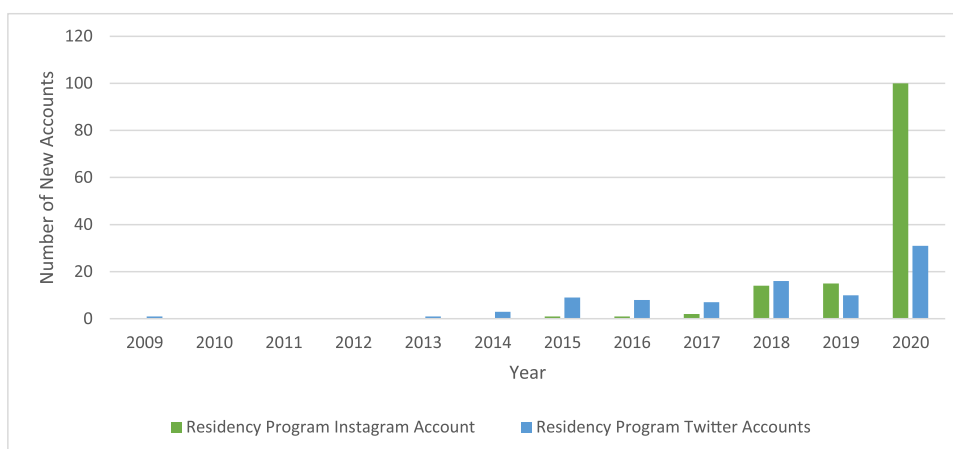


FIGURE 2. Number of residency Twitter and Instagram accounts created by year of initial creation (Twitter) or first post (Instagram).

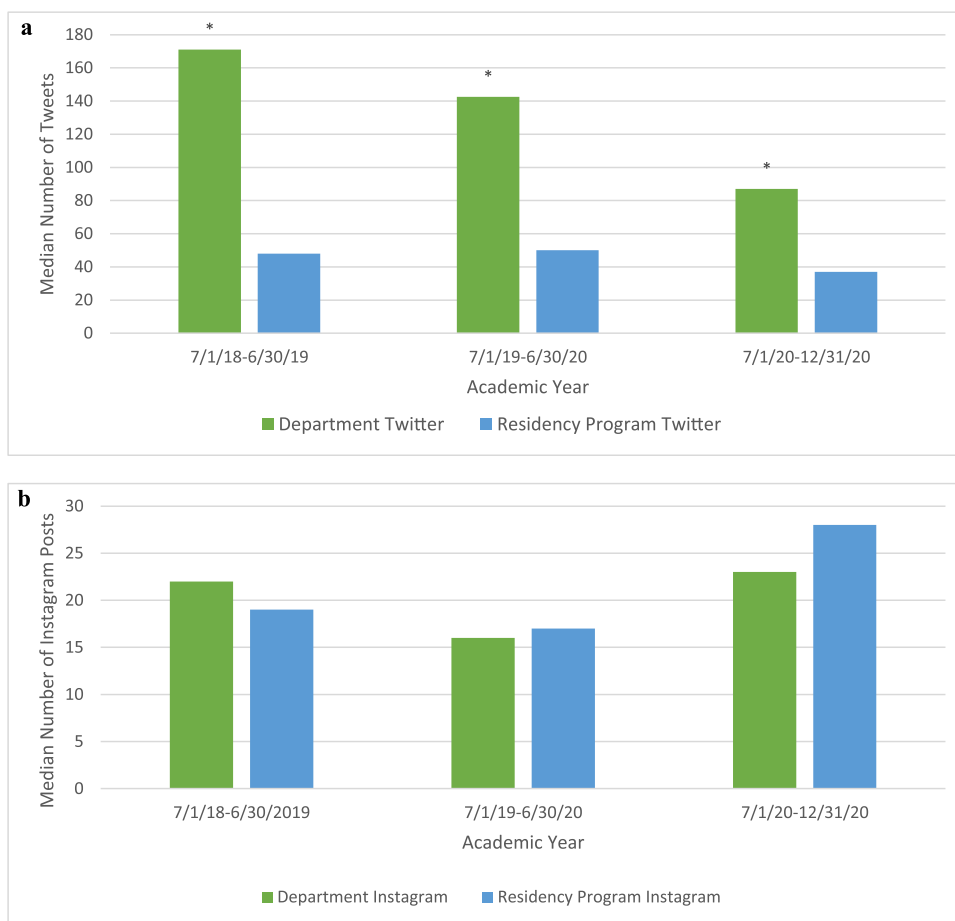


FIGURE 3. Median number of posts per department and residency account by academic year (7/1-6/30). **3a.** Median number of tweets per account per academic year (* p -value ≤ 0.01). **3b.** Median number of Instagram posts per account per academic year.

run by non-physicians.¹⁰ This may potentially explain some of the discrepancy in number of Twitter posts, given that many of the residency accounts note that accounts are “resident-run.” Further, there are a larger number of residency Twitter and Instagram accounts, compared to department accounts, which may partially account for the lower median number of posts during the academic year. Interestingly, the number of residency Instagram accounts are more than five-fold greater than those associated with a department, with a large majority of the residency accounts being created in 2020. This may be due to the increased preference of Instagram by current learners in medical school and GME, compared to medical educators, which may be driving the rapid rise in residency Instagram accounts.¹⁶

The application cycle changed dramatically in 2020-21 due to the COVID-19 pandemic, halting in-person away rotations and resulting in an abrupt shift to virtual presence in social hours and interviews.^{6,13} With recent studies reporting that up to 100% of medical students use social media, it seems that social media, particularly

Twitter and Instagram, may continue to play a central role in future application cycles and may be or become an increasingly important resident recruitment tool.¹⁶⁻¹⁸ Previous studies have found that residency program applicants search out and use social media to help gain information about residency programs.^{2,6,19,20} While none of these studies note frequency of posting as an indicator for improved recruitment, they do note that residency accounts were used to learn more about programs in general. Although the number of posts needed to improve residency program recruitment has not been specifically examined, there is some thought that more posts lead to a higher level of engagement.^{11,14} As it relates to the differential use in Instagram and Twitter, we hypothesize that Instagram may be perceived by applicants as a platform that better depicts a program’s culture compared to Twitter, which may be used more to explore specific professional components, such as recent publications or presentations at national conferences. While Instagram may highlight more cultural aspects of a program, like social hours and life outside of the hospital.

Other surgical subspecialties, including plastic and reconstructive surgery, urology, vascular surgery, otolaryngology, and oral maxillofacial surgery, have a well-documented history with social media use, particularly with Twitter and Instagram.^{7-9,11,12,14,21-23} Similar to the current study, these studies note increased utilization over time; like others and based on the trends depicted in the current data, we hypothesize that there will be continued utilization in the future.¹⁴ It seems that virtual presence has been integral in resident recruitment in the 2020-2021 residency application cycle. The impact social media can have on resident recruitment and applicant decision making remains unclear. Understanding the components of virtual engagement that were effective for both programs and applicants is necessary to refine and optimize use in future cycles, particularly if there is persistent role for virtual interviewing.

As with all studies of social media use, there are limitations to our study. We can only report social media use as a snapshot in time. While the study evaluated department and residency specific accounts over the past two and half academic years, any conclusion drawn about number of posts or followers represents a state of constant fluctuation. These accounts have been highlighted as either resident- or department-specific in their headlines or account names, but we did not study who serves as the administrator. This limits the ability to draw conclusions about the discordance in the number of accounts and new accounts compared to usage of such accounts. Similarly, we can only infer the intent of these accounts, but are unable to draw conclusions because the content of the posts were not studied, nor was the engagement of the account. Due to this we are unable to draw substantive conclusions about the target audience, resident recruitment, research spotlights, or social use. It is also possible that we may not have identified all social media accounts of a department or program, or that some of the accounts may have been created and subsequently deleted. While we did search program websites, use internet searches, and search social media platforms it is still possible that we missed accounts, or misidentified accounts. Further, while we can speculate about why a new influx of social media accounts were created in 2020, this may be due the increasingly ubiquitous nature of social media in modern day life, in addition to the significant changes that occurred around the COVID-19 pandemic. Only general surgery departments with an ACGME accredited residency program were included in this study, limiting the generalizability of these findings with any general surgery departments without an ACGME-accredited residency program.

Overall, the data demonstrate that, aligned to an unpredictable and virtual COVID-19-impacted residency application season, there was a significant increase in the

number of residency Twitter and Instagram accounts in 2020, with usage favoring academic programs. This rise was most apparent with residency programs, rather than for departments, that might be leveraging the platforms to engage a population of learners who are known to use social media and might be searching out ways to understand programs with a lack of live options. Given this influx of social media use, we recommend that residency and department accounts follow published guidelines on social media use from various academic societies and organizations.²²⁻²⁷ Future study should focus on the ideal usage patterns of social media to assist in resident recruitment and engagement across all platforms.

CONCLUSION

While departments generate more usage in an established account, in 2020 alone, the total number of residency accounts outpaced those of departments, most strikingly with Instagram, in which the number residency accounts are nearly five-fold greater. Further, the number of new Twitter and Instagram residency accounts increased by nearly three- and seven-fold respectively, in 2020 alone, with Instagram accounts exceeding those of Twitter by 1.6-fold. This significant increase may have been influenced by the COVID-19 pandemic and the subsequent migration to a virtual interview season, suggesting an unprecedented need for online engagement with applicants. It is likely that the transition to increased social media presence will persist for future application cycles, and further study about the impact of increased residency account social media use on the application cycle is needed.

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